



DEPARTMENT OF
ECOLOGY
State of Washington

**PROPOSED TECHNICAL SUPPORT
DOCUMENT FOR PREVENTION OF
SIGNIFICANT DETERIORATION PERMIT**

**PERMIT NO: PSD 11-05
Amendment 2**

**Puget Sound Energy
Fredonia Power Generating Station**

Prepared by

**Air Quality Program
Olympia, Washington**

March 1, 2017

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EXECUTIVE SUMMARY

Puget Sound Energy (PSE) was issued a Prevention of Significant Deterioration (PSD) permit (No. 11-05) on October 24, 2013. The permit is to expand their Fredonia Generating Station in Mt. Vernon, WA. The expansion will provide 181–207 more megawatts of energy to meet future needs. The new simple cycle combustion turbines will run on natural gas. Ultra-low sulfur diesel fuel oil will be used as a back-up fuel.

PSE has requested two time extensions for the permit. The first extension was granted on August 25, 2015. This amendment proposes to approve the second time extension request.

The extensions will not impact the quality of air. Air pollutants not included in the PSD are covered under the Northwest Clean Air Agency's (NWCAA's) Order of Approval to Construct.

1. INTRODUCTION

1.1. The Permitting Process

1.1.1. The PSD process

PSD permitting requirements in Washington State are established in Title 40, Code of Federal Regulations (CFR) §52.21 and Washington Administrative Code (WAC) 173-400-700 through 750. Washington State implements its PSD program as a State Implementation Plan (SIP) approved program. This SIP approved program became effective May 29, 2015.

1.2. Site and Project Description

1.2.1. Site description

The FGS facility is located at 13085 Ball Road near Mount Vernon, Skagit County, Washington (see Figure 1). The site is on the south side of Ovenell Road, southwest of the Skagit Regional Bayview Airport, approximately 2.5 miles inland of Padilla Bay. The proposed project is not expected to increase the current footprint acreage of the site, which is approximately 40 acres.

The terrain surrounding the facility is essentially flat. The elevation of the facility is approximately 50 feet above mean sea level (MSL).

The FGS facility is located in a Class II area that is designated as “attainment or unclassifiable” for the purpose of PSD permitting for all pollutants.

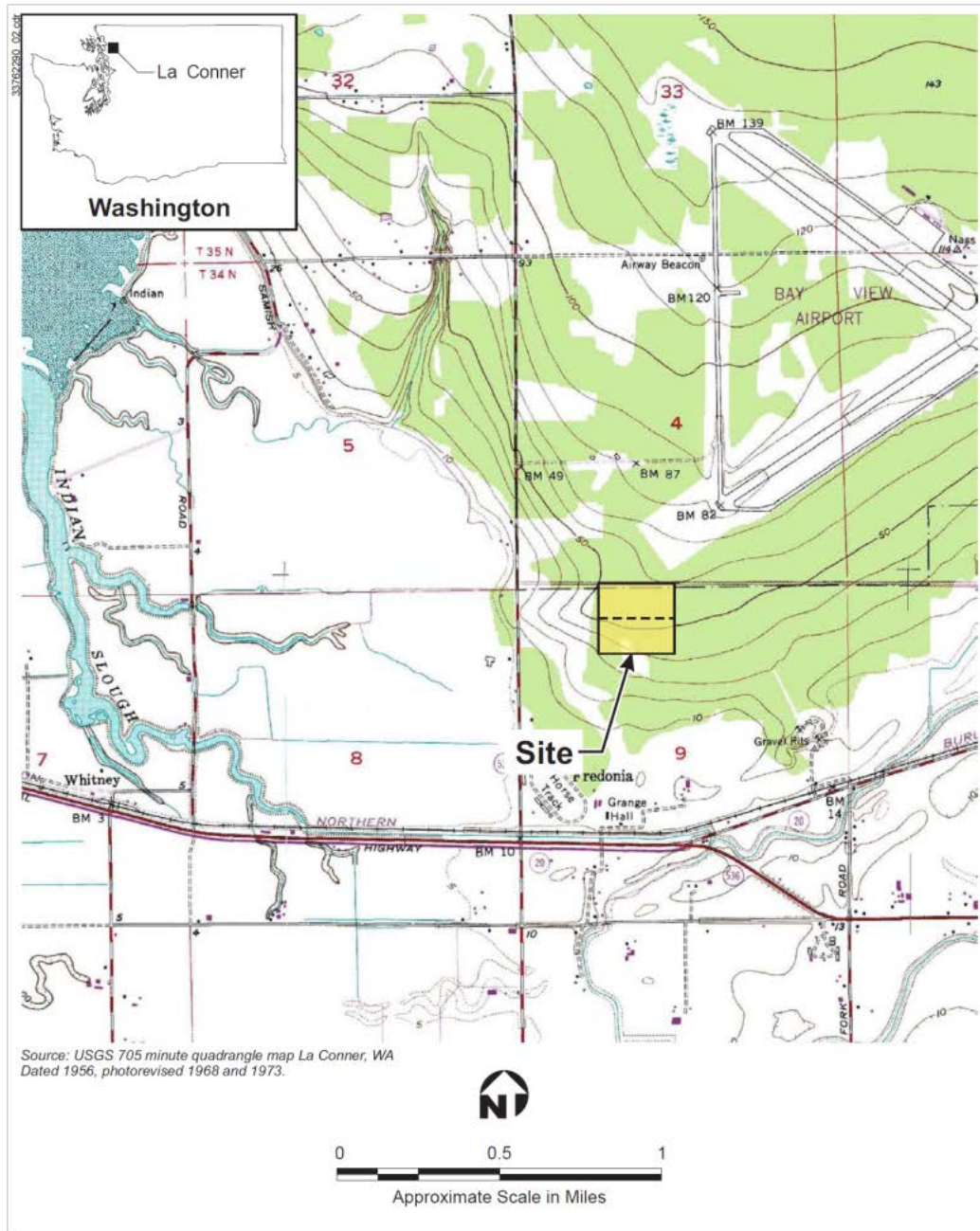


Figure 1. The FGS facility location map

(Source: PSE's PSD application 2nd revision, received July 7, 2011)

1.2.2. Amendment description

PSD permit number 11-05 was officially issued on October 24, 2013. On August 25, 2015, Ecology amended PSD No. 11-05 allowing PSE additional time to commence construction. At that time, PSE was preparing the biennial Integrated Resource Plan (IRP) to examine PSE's electric and gas resource needs for the next 20 years. PSE uses the IRP analysis before pursuing construction on the Fredonia facility. Ecology found that PSE's request was justified and granted the time extension.

On October 22, 2016, PSE submitted a second time extension request. PSE explains that due to the delay, they discovered that the turbine technology provided in the original application during 2012 may not be available from the manufacturer. PSE needs additional time to evaluate the updated vendor information to ensure the currently available products meet the specifications provided in the original application. If the currently available products do not meet the specifications provided in the original application, PSE may need to request a modification of the original PSD permit.

Ecology finds that an extension of the deadline for commencement of construction is justified.

2. STATE ENVIRONMENTAL POLICY ACT

Ecology had concluded that the applicant had adequately demonstrated compliance with State Environmental Policy Act (SEPA) requirements prior to the issuance of the permit. SEPA requirements are still considered complete for this project. The amendment only is an extension of the deadline for commencement of construction. Skagit County was the lead agency for SEPA for this project.

3. BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATIONS

The Best Available Control Technology (BACT) evaluation of EPA's RACT/BACT/LAER Clearinghouse (RBLC) was reviewed to refresh the BACT analysis that was done for the PSD permit for the proposed project.

- The original permit application used information that was accessed from the RBLC on May 31, 2011.
- The first permit amendment application included the BACT/LAER determinations found in RBLC from May 31, 2011, to January 27, 2015.
- This permit amendment (2nd amendment) application includes the BACT/LAER determinations found in RBLC since January 27, 2015. PSE also includes several BACT/LAER determinations issued prior to January 27, 2015 that were previously not included in the first permit amendment application due to the late entry into RBLC.

From 33 separate permits BACT/LAER or other “case-by-case” determinations searched for large simple-cycle industrial gas turbines, the determinations made for individual pollutants are discussed below.

1. **Carbon monoxide (CO):** According to original PSD No. 11-05, only the Siemens SGT6-5000F4 frame turbine triggers PSD for CO and subject to 4 ppm_{dv} @ 15% O₂ when firing natural gas and 8 ppm_{dv} @ 15% O₂ when firing diesel fuel. Therefore, this review is specifically to refresh the BACT analysis for the Siemens SGT6-5000F4 frame turbine.

In reviewing the RBLC, the highest level of control shown for CO for simple cycle turbine is 4 ppm_{dv} @ 15 percent O₂ (3-hour average) when firing natural gas. Only one facility lists this emission level as BACT with the use of Good Combustion Practices. Sixteen facilities have a BACT limit of 9 ppm_{dv} @ 15% O₂ (3-hour average), and two facilities has a BACT limits of 25 and 29 ppm_{dv}, all using Good Combustion Practices.

In reviewing the RBLC, the highest level of control shown for CO for simple cycle turbine is 9 ppm_{dv} @ 15% O₂ (3-hour average) when firing diesel. The other CO limit listed is 20 ppm_{dv} @ 15 % O₂ (3-hour average).

Therefore, Ecology will maintain the original CO BACT limits in PSD No. 11-05.

2. **Particulate matter (PM/PM₁₀/PM_{2.5}) and sulfuric acid mist (H₂SO₄):** The RBLC review of the current BACT limits for these pollutants utilize pipeline natural gas or ULSD. The updated RBLC database shows no other control technologies. Therefore, there are no changes to the PM, SO₂, or H₂SO₄ BACT limits.
3. **Greenhouse gases (GHGs):** There are 17 facilities that show BACT limits for CO_{2e}. The limits range from 1,232 to 1,874 lb CO_{2e}/MW-hr using low emitting fuels and efficient turbines. This is similar to the PSE Fredonia CO_{2e} levels range from 1,138 to 1,310 lb CO_{2e}/MW-hr for the turbines.

Therefore, Ecology will maintain the greenhouse gases BACT limits in PSD No. 11-05.

4. AIR MODELING

A review of the validity of the air quality impact and consumption modeling used in the original application was conducted by the applicant. Proposed equipment, stack parameters, and emissions for the FGS Expansion Project have not changed since the PSD permit was issued. In addition, there has not been any significant change in the existing air quality conditions in the project vicinity. Therefore, the air quality impact modeling for the original PSD permit remains valid for the requested permit extension.

5. PUBLIC COMMENT PERIOD

This PSD permitting action is subject to a minimum 30-day public comment period under WAC 173-400-740. A newspaper public notice announcing the public comment period was published in the Skagit Valley Herald on January 18, 2017. In accordance with WAC 173-400-740(2)(a), application materials and other related information made available for public inspection at:

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1600 South Second Street
Mount Vernon, WA 98273-5202
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Washington State Department of Ecology
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This public comment period ends on February 17, 2017, at 5 PM PDT. No comments were submitted.

6. AGENCY CONTACT

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ACRONYMS AND ABBREVIATIONS

BACT	Best Available Control Technology
CFR	Code of Federal Regulations
CO	carbon monoxide
CO _{2e}	carbon dioxide equivalents
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
FGS	Fredonia Generating Station
GHG	greenhouse gas
H ₂ SO ₄	sulfuric acid mist
HAPs	hazardous air pollutants
MSL	mean sea level
MW	Megawatts
NOC	Notice of Construction
NO _x	nitrogen oxides
NWCAA	Northwest Clean Air Agency
ppm	parts per million
PM	particulate matter
PSD	Prevention of Significant Deterioration
PSE	Puget Sound Energy
RBLC	RACT/BACT/LAER Clearinghouse
SCR	selective catalytic reduction
SEPA	State Environmental Policy Act
SO ₂	sulfur dioxide
ULSD	ultra-low sulfur diesel
VOC	volatile organic compound
WAC	Washington Administrative Code
WLE	Wet Low-Emission